Regional Sediment Management Benefits

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Why Identify & Quantify RSM Benefits?

- Communicate Benefits of Using a Systems Approach
- Engage partners and stakeholders in RSM
  - Better problem understanding; more creative solutions; leverage resources to plan and implement
- Accomplish more effective, efficient, & acceptable water resource problem solving

Report Summary & What's Next?

- Identify/document the range of RSM benefits
- Highlight the order of magnitude
- Demonstrate universality

- Discuss how we can better capture RSM benefits

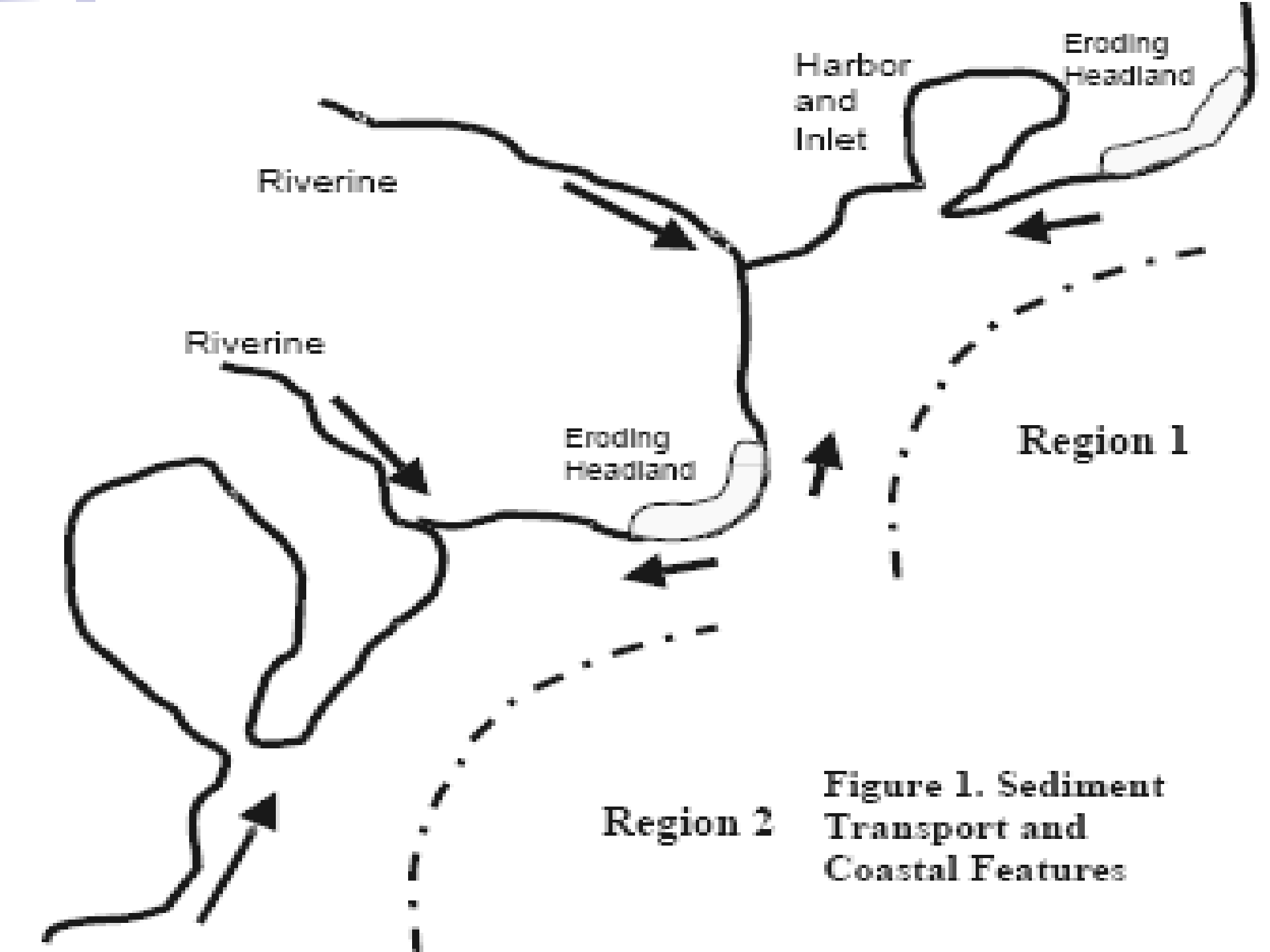


Figure 1. Sediment Transport and Coastal Features

Categories of Benefits

- Documented Savings
- Estimated Savings
- Hypothetical (Potential) Savings
- Qualitative Savings

Reductions in Mobilization/Demobilization and Dredging Costs

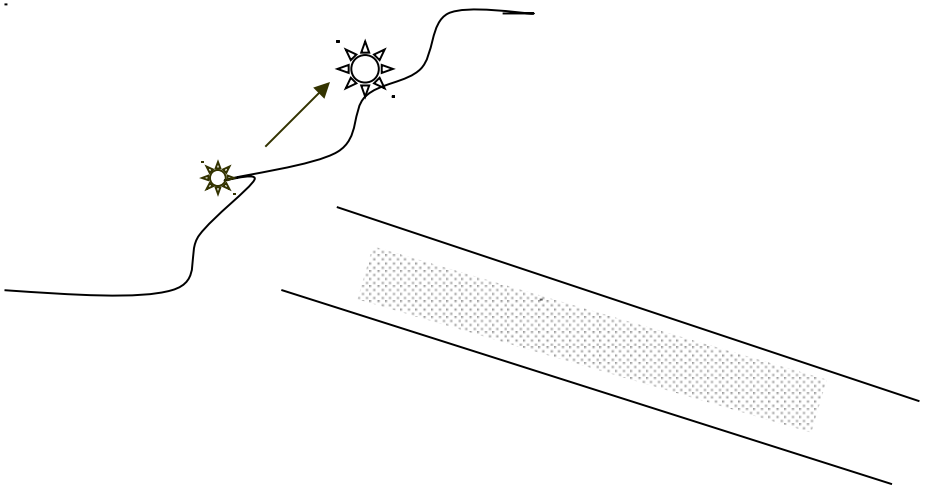
- Jacksonville District $1.4 million for St. Augustine Inlet & $1 million for Matanzas Inlet
- NY District $2 million for Sandy Hook-Sea Bright
- Mobile District $370,000 for East Pass IMP
- Port of Houston $23 million ($2 million mob/demob) and over $20 million in dredging

Savings in Environmental Study Costs

- Portland District saved at least 12 months of in-house labor (or $104,000) through blanket clearances
- Sea Bright NPS saved $500K (EIS vs. EA)
- LA's future DMMP cost savings as a result of CSBAT ~$200,000

Reduction in Volume or Frequency of O & M Dredging

- Perdido Pass ~$425,000/yr



Reduction in Dredging Volumes

- New Orleans' West Bay Diversion Project
  - District spent $3.6 million in unnecessary dredging and is expected to spend $1.75 million every three years
  - Now using RSM approach – anticipate less shoaling and reduced costs
- Lake Michigan strategically accreted material in littoral zone reduced harbor dredging costs by $330,000

Extending Lives of Disposal Sites

- Estimated costs of identifying & developing new sites
  - $185,000 to $1.8 million
  - Potential life cycle costs for new disposal site > $48 million (based on NAB's DMMP)
  - Helps better justify O & M
- RSM approach can help reduce these costs

Avoiding Upland Disposal and Associated Costs

- Piping $20/cy
- Trucking $50/cy
- Apalachicola, Black Warrior, & Tombigbee Rivers
  - Savings of $23/cy
- Savings in Land Costs
  - $14/ft^2 or $48 million for 80 acre site in LA County

Extending Infrastructure Lives

- Deferred/Avoided Repair Costs
  - $3.84 million/yr to maintain MCR jetties
  - $5,000/ft for construction
  - Coos Bay Breach $19 million for North Jetty alone
  - MCR supports $16B in commercial navigation
- Great Lakes Infrastructure
  - $ 5 billion, 80% of coastal facilities are >50 years
  - O & M averaged $60 million - $80 million/yr (though its funding has been declining)

Reduced Costs of Treating Contaminated Dredged Material

- $30/cy to $500/cy ($1,285/cy!!!) for oxidation and/or incineration methods

Reduced Likelihood/Frequency of Emergency Dredging

- $20/cy for routine maintenance
- $50/cy to $65/cy for emergency dredging
  e.g., SF $1.5 million for an episode in 1996 (in 2009 $)
- Wailoa Harbor Emergency Dredging = $994,000 to remove 25,000 cy of sand (dredging only)
- St. Joseph Harbor, Michigan (March 2009) $1 million
- RSM partnerships facilitate using material consistent w/ regional needs avoiding missed opportunities, streamlined permitting, etc.

Reduced Costs of Beach Nourishment

- St. Johns County vs. Duval County*
  - $4.77/cy savings
- Coney Island saved $66K in backpassing and $267K in bypassing for a total savings of $333K
- Long Island 6 Inlet Projects totaling $1.95 million
- New York District’s Rock Sharing Program from jetties and groin rehab projects (Savings >$1 million over past 10 yrs)

Fewer Beach Nourishment Downdrift

- Philadelphia District--Cape May bypassing found to eliminate 4 nourishment cycles totaling $3.4 million or $182,000 annually

Increased Navigation Efficiencies

- Reduced Light Loading or Greater Economies of Scale
  - Western Chesapeake Bay = $300,000
  - Additional Trucking Costs Hancock River = $187,000
  - Reduced relocation costs for fishermen
  - Port of Brownsville's lack of O & M cost $135,000 per vessel in tidal delays or via Mexican port
  - Port of Green Bay rerouted vessels
  - Monitoring Costs of Shoaling

Increased Navigation Efficiencies

- Reduction in Navigation Hazards Associated with Shoaling
  - In 2006, Noyo Harbor fishing vessel ran aground
  - Clean up Costs ~$100,000
  - Subsequent Delays = $200,000

Reduced Coastal Erosion Damage

- Cape Cod Canal
  - Structural Damage
  - Damages to Roads
  - Recreation Benefits
- Wrightsville Beach
  - $36 million in damageable property vs. $12,000,000 to bypass sand

Cape Cod Canal

Beach	Erosion Prevention	Road and Seawall Damage Prevention	Recreation	Total Annual Benefits	Benefit Cost Ratio
Spring Hill	$63,673	$0	$11,930	$75,600	2.37
East Sandwich	$10,235	$0	$11,930	$22,100	0.69
Chappaquoit	$0	$18,506	$42,940	$61,400	5.66
Wood Neck	$0	$0	$38,176	$38,200	6.70
Old Silver	$9,730	$0	$74,639	$84,300	7.66
Mashnee Road	$0	$45,176	$0	$45,200	4.24

Shore Protection Benefits (con't)

- RED Effects
  - Income
  - Expenditures
  - Jobs
  - Property Values
  - Increase Tax Base
    - Additional sales tax from beach-related industries
    - Additional property tax collected

RED Impacts

- Increased Tourism
- California Beach Fill

  - 50,000 to 400,000 cy would result in $70,000 to $600,000 overall increase in taxes

(King, 2006) – The Economics of Regional Sediment Management in Ventura and Santa Barbara Counties

Shore Protection Benefits (con't)

- OSE Impacts
  - Additional Recreation Opportunities
  - Improved Quality of Life
- Public Safety

Coastal Storm Damage Reduction

- Storm Surge Buffer
- Protection of Populations and Structures
- Reduced Federal Disaster Recovery Costs

Total = Tens of Millions Prevented

(USACE Wilmington District, Dec. 2000, 00-R-6) – Hurricane Fran Effects on Communities with and without Shore Protection: A Case Study at Six North Carolina Beaches

Combining Dredging and Nourishment

- Carpinteria, Goleta, Rincon Beaches
  - Benefit/cost ratios range 2:1 to 44:1

"The Economics of Regional Sediment Management in Ventura & Santa Barbara Counties"

RSM Outreach & "Resilience"

- New England District
  - Quicker decision (Bridgeport, CT example)
    - Avoided missed opportunity to use sediment
    - Saved costs
  - Growing political support for RSM
  - State participation (e.g. mapping)
- Mobile District
  - Post Hurricane Ivan
    - Emergency dredging; habitat restoration; reduced time to construct and for environmental clearances
- Stimulus Package??

Partnership benefits

- Declaration of Cooperation for RSM Planning (Mouth of Columbia)
  - WA, OR, Estuary Program, NMFS, Corps, other
- Supportive resource agencies (Cape May, NJ)
- Political support for RSM approach
  - Sec 2037 WRDA 07 – amendment to CAP 204

Increased “Flexibility” of Dredging/Disposal

- Pascagoula = better relationships with regulatory agencies led to add’l options for dredged material placement

- Wilmington = stockpile material rather than going offshore
  - Keeping material available

Contribution to Species Recovery

- Piping Plover (Cape May, NJ)

  - 1993 Breeding Season ~ $1.8 Million
- Atlantic Salmon (Gulf of Maine)

  - ~ $36.6 Million for First 3 Years
- Bull Trout (Puget Sound, WA)

  - ~ $68 Million Over 25 Years
- Walla Walla District – salmon mitigation, habitat restoration

Benefits of Sharing Information

- Increased efficiency
- Operational benefits
- Strategic benefits
- External benefits
- B/C Ratios range from 4 to 6

"ASSESSING BENEFITS OF GEOGRAPHICAL INFORMATION SYSTEMS IMPLEMENTATION" Franz-Josef Behr

Avoided Duplication Costs

- New Orleans used Mobile Data
  - Taking advantage of Mobile investment ($250,000); MVN costs reduced to $40,000
- Other examples?

Additional Benefits

- Fewer/Smaller Lawsuits
- Reduction in Environmental Damage/Fines
- Reduction in Species Recovery Costs
- Reduction in Water Treatment Costs
- Reduced Effectiveness of Reservoirs
- Benefits Realized Sooner

Future Needs

- Northern Gulf of Mexico Alliance
- Information from:
  - Galveston District
  - Charleston District
  - Buffalo District
  - “Heartland” District
  - Honolulu District

District Offices Contacted

- NAN/NAD
- NAE
- NAP
- SAW
- SAM
- SAJ
- NWW
- NWD/NWP
- SPL
- SPN
- MWN
- LRD

Tentative Schedule

- Finalizing Framework at RSM Conference (September 2008)
- Summarize Findings at RSM Conference (April 2009)
- Draft Report (~15 May 2009)
- Finalize Report (30 June 2009)